

CLAIMS

1. A method for encapsulating services for transmission over a physical medium, comprising:

5 receiving a frame from a metallic link, said frame being formed according to an encapsulation protocol and containing an encapsulated protocol data unit; and
processing the frame.

2. A method, comprising:

10 receiving a first protocol data unit formatted according to a first service;
encapsulating the first protocol data unit in a first frame;
transmitting the first frame over a first physical medium;
receiving a second protocol data unit formatted according to a second service;
encapsulating the second protocol data unit in a second frame; and
15 transmitting the second frame over a second physical medium;
wherein the first frame and the second frame are of the same format.

3. A method of encapsulating protocol data units for transmission in a communication network, the method comprising the steps of:

20 encapsulating a first protocol data unit using generic framing procedure to form a first frame;
transmitting the first frame over a first metallic link.

25 4. The method of claim 3, wherein the first protocol data unit is formed according to a first protocol, said first protocol being selected from the group comprising ATM, Frame Relay, Ethernet, and Internet Protocol.

30 5. The method of claim 3, wherein the first frame is transmitted over the first link using a physical layer protocol, said physical layer protocol being selected from the group comprising one of the Digital Subscriber Line protocols, one of the T/E/DS protocols, and a protocol used for transmission of signals over cable television wires.

6. A method, comprising:
 receiving an Ethernet frame;
 encapsulating the Ethernet frame in a Generic Framing Procedure (GFP) frame; and
 transmitting the GFP frame over an interface to a T1 metallic link.

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7. A method, comprising:
 receiving GFP frames over an optical data link; and
 forwarding the GFP frames over a metallic link.

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8. A network device, comprising:
 a first line interface unit configured to interface with a first physical medium; and
 a universal mapper configured to map protocol data units from multiple services onto
 frames for transmission over the first line interface unit.

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9. The network device of claim 8, further comprising a second line interface unit
 configured to interface with a second physical medium; and
 wherein the universal mapper is configured to map the protocol data units from the
 multiple services onto frames for transmission over the second line interface unit.

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10. The network device of claim 8, wherein the universal mapper is configured to
 receive the protocol data units and map the protocol data units into Generic Framing Procedure
 (GFP) frames.

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11. The network device of claim 8, further comprising an optical line interface unit
 configured to interface with an optical transmission medium; and
 switching circuitry configured to interconnect the optical line interface unit with the first
 line interface unit.

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12. The network device of claim 11, wherein the switching circuitry is configured to
 switch Generic Framing Procedure (GFP) frames between the optical line interface unit and the
 first line interface unit.

13. The network device of claim 10, wherein the GFP frames comprise a core header and a payload, said payload being configured to contain at least one of said protocol data units.

14. The network device of claim 13, wherein the core header is configured to contain an indication of the length of the payload, wherein the payload is configured to contain a payload header, and wherein the payload header is configured to contain an indication of the type of protocol data unit contained in the payload.

15. The network device of claim 14, further comprising a GFP-service mapper for each service supported by the network device.

16. The network device of claim 15, wherein the network device supports multiple physical mediums, and wherein the GFP-service mappers map protocol data units to GFP frames for transmission over all physical mediums supported by the network device.

17. The network device of claim 16, wherein the physical mediums each comprise a metallic link coupled with a physical layer transmission protocol.

18. The network device of claim 8, wherein the first line interface unit is configured to receive second frames containing second protocol data units, and wherein said universal mapper is further configured to process said second frames.

19. The network device of claim 16, wherein the second frames are Generic Framing Procedure (GFP) frames.

20. The network device of claim 17, further comprising an optical line interface unit, and wherein the universal mapper is configured to process the frames by causing the frames to be transmitted by the optical line interface unit.

21. The network device of claim 17, further comprising an optical line interface unit, and wherein the universal mapper is configured to process the frames by multiplexing multiple GFP frames into a larger GFP frame and passing the larger GFP frame to the optical line interface unit.

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